CLAIMS

1. An ultrasonic processor (10) for the separation of a liquid mixture, the processor comprising an enclosed processor chamber (12) having opposite end walls (18 and 16) and input and output mixture carrying ports (40) and (42) communicating with the process chamber (12) for the throughput of the mixture to be processed and a bank of ultrasonic converter units (22, 24) coupled to a wall (18) of the processor chamber (12) for transmitting ultrasonic waves to the mixture in the processor chamber (12) characterised in that the input port (40) is displaced from the output port (42) along a connecting wall (14) of the chamber (12) in a direction substantially perpendicular to the chamber wall (18) to which the bank of ultrasonic converters (22, 24) is coupled.

2. An ultrasonic processor according to claim 1 and in which the converter units (22,24) in operation create an ultrasound stable standing wave pattern (44) of multiple wavelengths between the input (40) and the output ports (42) of the ultrasonic processor (10) and along the length of the processor chamber (12).

3. An ultrasonic processor (10) according to claim 2 and in which the displacement of the input port (40) from the output port (42) along the length of the processor chamber (12) is greater than the wavelength of ultrasound created by the ultrasonic transducers (22) in processor chamber (12).

4. An ultrasonic processor (10) according to claims 1, 2 or 3 and in which the chamber (12) comprises a sealed metal container having substantially parallel enclosing walls18 and 16, the ultrasonic converter units (22,24) being coupled to the wall (18).

5. An ultrasonic processor (10) in accordance with claim 3 and in which the parallel walls (16 and 18) are separated by a distance which is an integral or half integral multiple of wavelength of the ultrasound standing wave.

6. An ultrasonic processor according to any preceding claim in which the input port (40) is at the bottom of the process chamber (12) and the output port (42) is at the top of the chamber (12).

7. An ultrasonic processor as claimed in any preceding claim, wherein the wall (18) upon which the ultrasonic converter bank is mounted is at least substantially flat.

8. An ultrasonic processor according to claim 5 in which the processor chamber is of tubular construction.

9. An ultrasonic processor according to claim 5 in which the processor chamber is non-cylindrical.

10. An ultrasonic processor as claimed in claim 1, wherein the length of the individual converter units (22,24) is at least substantially half a wavelength of ultrasound at the driven frequency of the converter units.

11. An ultrasonic processor claimed in claim 1 wherein the converter units (22,24) are driven in phase with each other.

12. An ultrasonic processor as claimed in claim 1, wherein the individual converters units of the bank of converters (22, 24) are comprised of: a back plate (38), a transducer module (22) and a wave-guide (24); the parts so assembled being compressed at predetermined torque by compression bolt (25) passed through the back plate (38) and transducer module (22) and screwed into one end of the wave-guide (24), the other end being metallically or chemically bonded to the processor chamber wall (18).

13. An ultrasonic processor in which the back plate (38), as claimed in claim12 may be of stainless steel, titanium or aluminium.

14. An ultrasonic processor as claimed any preceding claim in which the wave-guide (24) has the same cross sectional area along its length as the transducer module (22) to which it is connected.

15. An ultrasonic processor in which the wave-guide (24) as claimed in claim 12 increases in width along its length to have substantially greater cross section at wall (18) than the transducer module (22) to which it is connected and thus transform power density at the face of the module to a lower density over a greater area.

16. An ultrasonic processor in which the wave-guide (24) as claimed in claim 12 may be conical, pyramidical or other configuration invert of welding-transducer horn design.

17. An ultrasonic processor as claimed in claim1 wherein the chamber wall (18) is mounted to the chamber enclosure (12) by an acoustic isolation means.

18. An ultrasonic processor as claimed in claim1 wherein the length of the individual converter unit of the bank of converter units (22.24) mounted to the chamber wall (18), is substantially a quarter of a wavelength of ultrasound therein at a driven frequency of the ultrasonic transducer.

19. An ultrasonic processor as claimed in claim 1 in which a bank of wave-guides of pyramidical form truncated to accept ultrasonic energy from the transducer modules (22), is bonded to chamber wall (18) with edges of respective wave-guides within 5 cm or less of each other on the chamber wall.

20. An ultrasonic drill cuttings treatment system comprising at least one ultrasonic processor (10) as claimed in any preceding claims.

21. An ultrasonic processor substantially as herein described with reference to, and illustrated in, the accompanying drawings.

22. An ultrasonic drill cuttings processing system substantially as herein described with reference to, and as illustrated in accompanying Fig 6.